

NOTES ON THE GENERIC AFFINITIES OF CERTAIN CICADELLIDAE (HOMOPTERA).

With Descriptions of a New Genus and Two New Species.*

HERBERT OSBORN.

The following notes are based in considerable part on material collected some years since when engaged upon a study of the Leaf-hoppers affecting Cereal and Forage crops the results, especially those bearing on the economic problems involved, appearing in Bulletin 108 of the New Series of the Bureau of Entomology. A considerable amount of material illustrating the distribution and habits of species not directly connected with cultivated crops was accumulated but detailed study of this material has been delayed for various reasons but especially by the pressure of other duties connected with my university work.

It is hoped that in time a paper dealing more extensively with our American Leaf-hopper fauna may be possible but in the meantime it seems desirable to present some observations on the generic affinities of certain groups and to publish the descriptions of new forms so they may be available to other students of the group.

I am indebted to members of the staff of the U. S. Bureau of Entomology for numerous favors, especially to the lamented Prof. Webster, who was chief of the Division of Cereal and Forage Crops at the time the collections were made, and to Dr. L. O. Howard for his interest and encouragement. The figures presented are from the skillful hands of Miss Charlotte M. King and Mr. J. D. Smith and are duly credited in each case.

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Dorycephalus minor n. sp. (Fig. 1.)

Very similar to *D. platyrhynchus* Osb. but smaller the elytra in female short and the vertex especially in male distinctly shorter the female segment more produced. Length: female 12 mm.; male 7 mm.

Head flattened and produced the vertex in female more than twice and in the male a little less than twice longer than wide. Vertex nearly parallel sided the apex rounded. Front depressed at sides slightly convex medially; clypeus short, rounded at tip; loræ rounded above

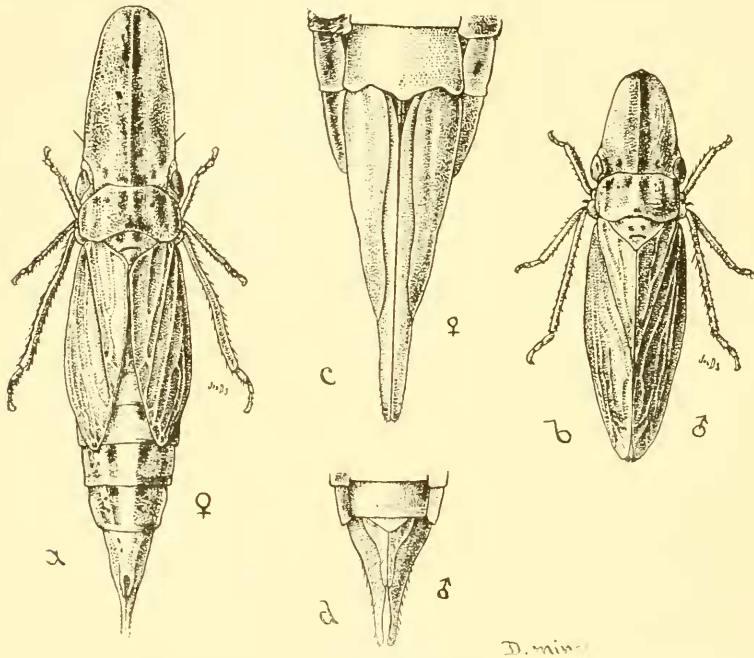


Fig. 1. *Dorycephalus minor* n. sp. a, female dorsal view; b, male dorsal view; c, genitalia of female; d, genitalia of male. (From drawings by Mr. J. D. Smith.)

tapering below. Pronotum nearly twice wider than long, posterior margin distinctly sinuate. Elytra abbreviated, reaching beyond fourth abdominal segment, tips strongly divergent, commissural line curved. Wings very short about half the length of the elytra.

Color: Dull straw color, vertex with a central broken stripe of fuscous indicated also on the anterior or part of the pronotum in the female and with two distinct dark spots on the disk of the scutellum in both sexes. A double row of black spots on dorsum of abdomen beneath, sides of frons fuscous a central dark area on abdomen of male.

Genitalia: Ultimate ventral segment of female angularly produced at middle, ovipositor extending about one-fourth its length beyond tip of pygofer. Male valve very short, rounded behind, plates broad at base, sharply contracted to near middle and extending as narrow tapering apices to beyond the middle of the pygofer.

While very similar to *platyrhynchus*, and possibly only a well marked variety, this species is distinctly smaller, the central fuscous stripe in the female is more pronounced and the hind margin of female segment angularly produced and in the male there is a very evident difference in the shorter head and smaller size. Moreover the specimens were taken in a tract of prairie grass at Brookings, S. Dak., where no *Elymus*, the foodplant of *platyrhynchus*, was to be found.

Type No. 22811, female allotype, male paratypes, in National Museum, in Osborn Collection, Ohio State University; all taken at same time, June, 1909, Brookings, S. Dak.

***Neoslossonia putnami* Osborn. (Fig. 2a.)**

Dorycephalus putnami Osborn Dav. Acad. Sci. X, p. 163 (1907).

Neoslossonia atra Van Duzee Bul. Buf. Soc. Nat. Hist. IX, p. 218 (1909).

This species has been taken very rarely so far and the only suggestion as to food habit is the note of VanDuzee that one of the two specimens that he took in Florida was from a Palmetto "hummock." The specimen from which the writer described the species came from Chester, Ga., which I take it is out of the range of the palmetto so that it should be looked for in a palmetto association rather than upon this plant itself.

Only males have been described and it is possible that the female is a short winged form that does not occur where easily taken in ordinary sweeping. I did not find any signs of the species in examining palmetto in the isolated patch occurring on Smith Id., N. C.

The males are densely black and the details of genitalia shown in the accompanying figure will serve to identify the species in this sex. The females should be sought in protected parts of the plants where males may be found and if not discovered on leaves or stems should be looked for at the crown or even below the surface of the ground. No doubt examples of both sexes and the nymphal stages will be found in abundance when the proper habitat and food plant is determined.

In venation of clavus which VanDuzee makes one of the principal characters for the genus this species agrees perfectly with *Dorycephalus* and about the only basis for separation is the shorter, more triangular furrowed head and the black color.

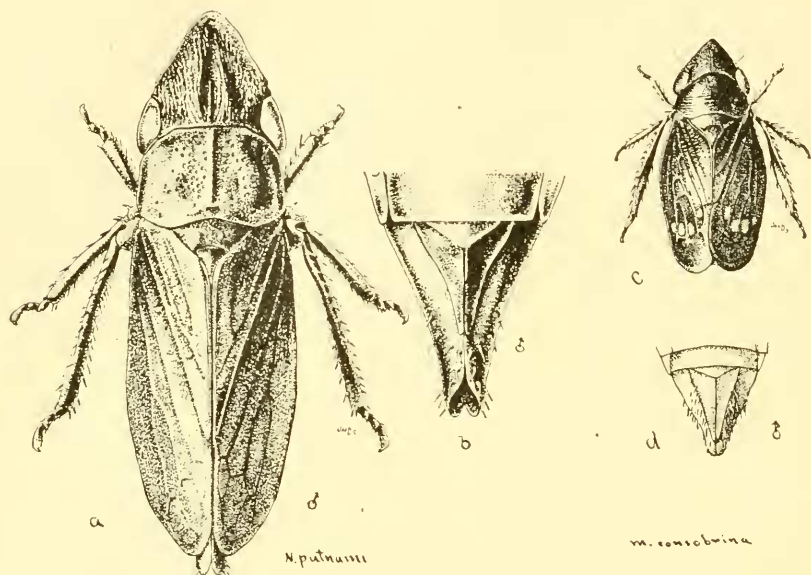


Fig. 2. *a*, *Neoslossonia putnami*, male dorsal view; *b*, genitalia of male; *c*, *Memnonia consobrina*, male dorsal view; *d*, male genitalia. (From drawings by Mr. J. D. Smith.)

Memnonia Ball.

This genus is placed by VanDuzee next to *Xestocephalus* in the Acocephalini but in general fascies and shape of head and especially in the position of the ocelli these genera seem to be more closely related to *Parabolocratus* or *Dicyphonia* and in depth of head and rounded margin nearer *Nionia* and *Drionia*. I took *M. consobrina* Ball as far east as Ottawa County, Kansas. (Fig. 2*c*). I have it also from Clay County of that state.

Dicyphonia Ball.

Dicyphonia ramentosa Ball, which I have taken in western Kansas, seems to me to stand between the flatter, broad-headed *Parabolocratus* on one side and the sharp-nosed *Acurhinus* and *Cochlorinus* on the other. Except in the shorter head and flatter body it represents fairly well the Dorydine group of the old world.

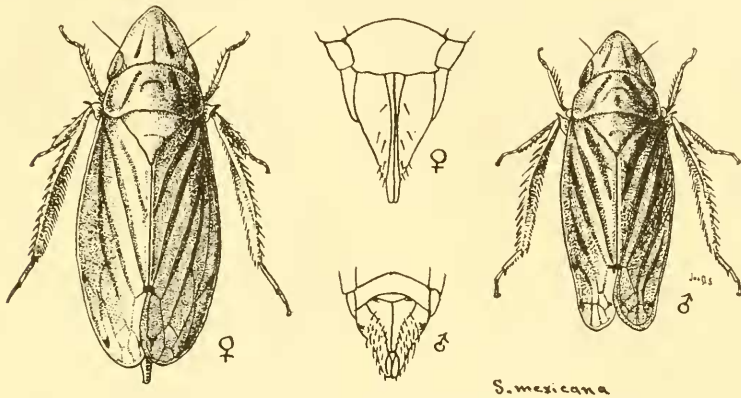


Fig. 3. *Spangbergiella mexicana*; dorsal view and genitalia of female and male as indicated. (From drawings by Mr. J. D. Smith.)

Spangbergiella Sign.

This genus is tropical or subtropical but *vulnerata* and *mexicana* extend into the southern U. S. The single vein of clavus seems the most evident character structurally, but the oblique, red stripes of vertex and pronotum appear constant. Lathrop* has indicated the characters for separating the species and connected the sexes I believe correctly.

* Cicadellidae of South Carolina, Bull. S. C. Exp. Sta., 1919.

Parabolocratus Uhler.

This genus is very closely related to the preceding but aside from having two claval veins and the absence of oblique stripes, the most evident characters, the head is shorter, more paraboloid and elytra usually shorter. The species *flavidus*, *viridis* and *major* present many gradations and it is possible that with sufficient material may be connected but *flavidus* is essentially southern *major* northeastern and *viridis*, while widely distributed, seems best represented in the Mississippi Valley and the plains region.

Cochlorhinus, *Uhleriella* and *Huleria* are all Pacific coast forms and I have attempted to show their affinities in the key while the excellent descriptions of Uhler, Ball and VanDuzee will enable the student to readily identify the different species listed in Van Duzee's Catalogue.

Acurhinus nov. gen.

Head strongly produced, the vertex with sides nearly straight subacute, apex acute, slightly concave above, frons reaching close to eyes, antennal pits touching eyes and ocelli very close to eye border. A decided furrow beneath the margin between vertex and front and the front strongly convex. Costa with strongly reflexed veinlets next the outer anteapical which is much reduced.

The species grouped here have some striking resemblances to *Dicyphonia* on one hand and to *Platymetopius* and *Deltocephalus* on the other but they seem to me to belong rather between *Dicyphonia* and *Cochlorhinus* than in the group Deltocephalaria. In fact *maculatus* was placed doubtfully in the genus *Dorydium* at the time of its description.

Type of the genus *Acurhinus maculatus* (Osborn).

Acurhinus maculatus (Osborn).

Dorydium (?) *maculatum* Osborn, Ohio Naturalist, Vol. IX, p. 464.

This species, described from Guatemala, differs from *pyrops* quite distinctly in that the dark markings of the front are oblique or nearly longitudinal instead of forming transverse teeth projecting from the blackish area below the head margin and the elytral nervures are not so strongly margined with fuscous. The female segment is broadly concave, not excavate at middle.

***Acurhinus pyrops*. (Crumb).**

Deltocephalus pyrops Crumb Ann. Ent. Soc. Am. Vol. DeLong Bulletin, Tenn. Exp. Sta.

Platymetopius pyrops VanDuzee Catalogue, 1917. Lathrop, Leaf-Hoppers, South Carolina Bull. S. C. Exp. Sta., 1919.

This species which was described as a *Deltocephalus* and later transferred by VanDuzee to *Platymetopius*, has been in my collection for some years. It has always seemed to me out of place in either of these genera and especially on account of the deep furrow below the vertex margin, and the cylindro-conic front to have closer affinity with the Dorydine series.

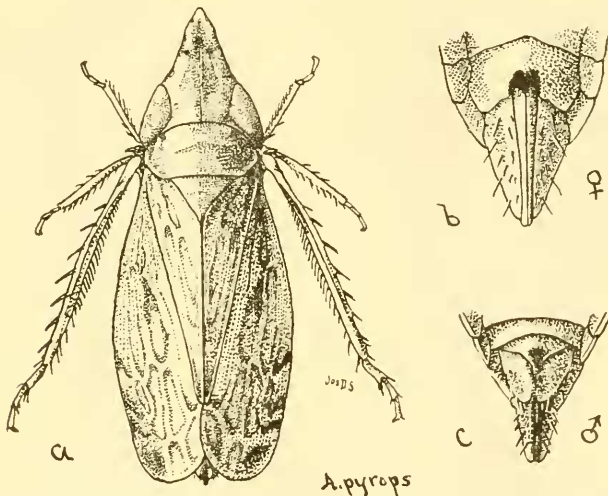


Fig. 4. *Acurhinus pyrops*. a, dorsal view of female; b, female genitalia; c, male genitalia. (From drawings by Mr. J. D. Smith.)

It seems clearly congeneric with *maculatus* which perhaps has the Dorydine fascies a little more pronounced but the two are so close in many structural points that their resemblance can hardly be ascribed to convergence.

The species was described from Tennessee has been reported from South Carolina and I have specimens from Southern Illinois through the kindness of Mr. C. A. Hart.

Dorydiella floridana Baker.

Dorydiella appears to me to belong to the division Dorydiaria rather than the Euscelidaria where it has been recently placed by VanDuzee. In the foliaceous margin of head, character of front and general fasciesit seems associated with *Cochlorhinus* and *Huleria* rather than with *Acinopterus*, next to which it was placed by VanDuzee, evidently on account of the similarly pointed elytra, a character, however, which is found also in *Dorydium* and some of its allies. Especially in head

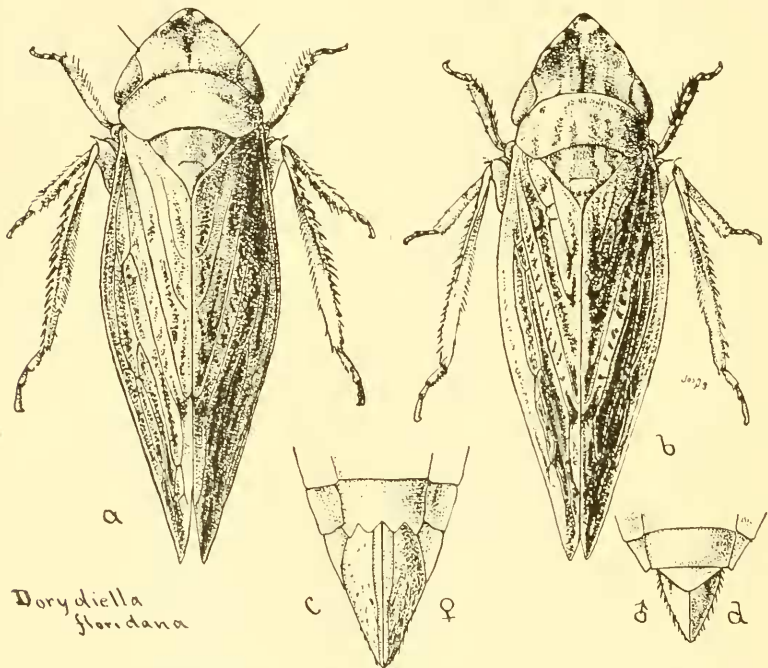


Fig. 5. *Dorydiella floridana*. a, dorsal view of male; b, dorsal view of female; c, genitalia of female; d, genitalia of male. (From drawings by Mr. J. D. Smith.)

characters *D. floridana* comes very close to *Huleria* Ball and I would place the genus next to this or perhaps group *Cochlorhinus* *Huleria* and *Dorydiella* together in a closely related series.

Of the American genera we may then consider *Dorycephalus*, *Neoslossonia*, *Hecalus*, *Spangbergiella* and *Parabolocratus* as forming one series; *Dicyphonia*, *Acurhinus*, *Cochlorhinus*, *Uhleriella*, *Huleria* and *Dorydiella*, another of close affinities,

with *Xestocephalus*, *Memnonia*, *Drionia* and *Nionia* as less distinctly related, although these latter genera present in the matter of ocellar location considerable agreement and their differences are due to varied development of the vertex.

***Drionia nigra* Ball.**

This very interesting species described from Medford, Oregon, may be recorded also from Mt. Shasta, Cal., a single specimen collected by Mr. Geo. Franck and kindly loaned to me by Mr. Chris. Olsen, agreeing perfectly with Ball's description.

***Nionia* Ball.**

This genus as indicated by Ball is very near to the old world genus *Tartessus* but differs in the absence of supernumary cell in the wing. It is a very robust form with strongly angled head but very short vertex which narrows decidedly between the apex and the eye.

It is represented in the South American fauna by a species that closely resembles our *palmeri* but my specimens from Coroicas Yungas, Bolivia, show wide variation in size and many of the individuals have the elytra distinctly brown instead of black.

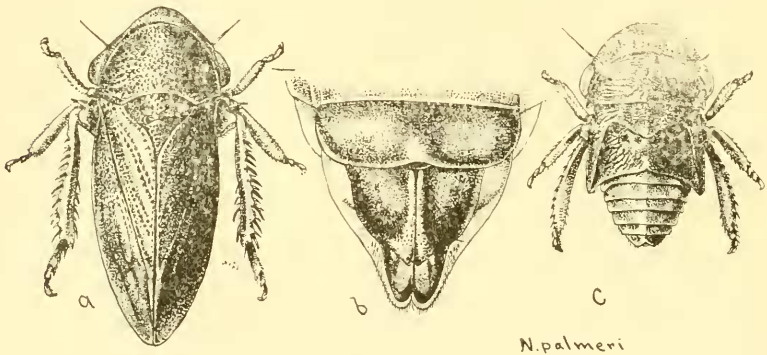
***Nionia palmeri* VanDuzee.**

This species is fairly common in the Eastern U. S. but not taken very commonly as it has evidently a distinctly restricted habitat. I have adults and nymph from Greensburg, Pa., kindly sent to me by Rev. M. Wirtner, and have also specimens from various points in Ohio, Maryland and Virginia.

The nymphs associated with the adults and very clearly belonging to this species are very robust creatures but little longer than wide, the head very short and broad, wider than the pronotum, with prominent eyes, polished but finely granulate, the pronotum short, more than twice wider than long, rugose, the meso- and meta-thoracic segments between the wing pads rough and with low median carina. The color is black except the eyes which in dry specimens are, like the adults, of a dead gray color, contrasting with the shiny polished body of jet black. Length, 2 mm.

The character of the nymph emphasizes the distinctness of this group from the other Jassinæ and if similar nymphs are found in *Drionia* and related genera would warrant the creation of a new division, separate from the *Dorydiaria* or *Deltocephalaria*, to receive them.

The division *Dorydiaria* of the tribe *Jassina* as placed by VanDuzee for North America includes for the most part genera in which the ocelli are directly on the margin of the head, between vertex and front and with heads flattened, the margin acute or foliaceous but including some forms in which the



N. palmeri

Fig. 6. *Nionia palmeri*. a, dorsal view of female; b, male genitalia; c, nymph. (From drawings by Mr. J. D. Smith.)

latter character is modified. While not a homogeneous group and, as constituted, including some genera which may well be subject to further study the following key is offered as an assistance in recognizing the generic affinities for the North American forms.

The group may be separated from *Acucephalini* by the fact that the ocelli are on the margin, not just behind it and from the *Deltocephalaria* by a greater overhang of the vertex on the front a character shared in some degree by some of the species of *Phlepsius*.

KEY TO NORTH AMERICAN DORYDIARIA.

- A. Head margin usually acute often very thin and foliaceous.
- a. Veins of clavus fused for the apical third.
 - b. Vertex very long sides nearly parallel with a median carina. *Dorycephalus*
 - bb. Vertex little longer than wide, triangular, furrowed. *Neoslossonia*
 - aa. Veins of clavus not fused apically.
 - c. Clavus with a single vein. *Spangbergiella*
 - cc. Clavus with two veins.
 - d. Ocelli at or near the border of the eye.
 - e. Costal veins not reflexed.
 - f. Head very broad with foliaceous margins. *Hecalus*
 - ff. Head narrower paraboloid or subtriangular. *Parabolocratus*
 - ee. With reflexed veins on costa opposite outer anteapical.
 - g. Head rounded in front, clavus with ramose veins. *Dicyphonia*
 - gg. Head acutely pointed, clavus with cross nervure. *Acurhinus*
 - dd. Ocelli remote from the border of the eye.
 - h. Elytra rounded at apex.
 - i. Vertex as long, or longer than wide.
 - k. Elytra long, anteapical cells long, vertex not spoonshaped. *Huleria*
 - kk. Elytra shorter, anteapical cells short, vertex spoonshaped. *Cochlorhinus*
 - ii. Vertex wider than long. *Uhleriella*
 - hh. Elytra acute at apex. *Dorydiella*
- AA. Head margin rounded or obtuse, not flattened.
 - a. Vertex longer at middle than next the eye.
 - b. Ocelli close to eye. *Memnonia*
 - bb. Ocelli distant from eye. *Xestocephalus*
 - aa. Vertex very broad, eyes widely separate, head wider than pronotum.
 - c. Vertex much produced, angular, pronotum extending before eyes. *Nionia*
 - cc. Vertex transverse, short, pronotum not greatly produced. *Drionia*

Deltocephalus viridis n. sp.

Light green, broad and short, occurring in long and short winged form; length 2.5 to 3 mm.

Vertex nearly as long as broad, about twice as long in the middle as next the eye, obtusely angulate, margin angularly rounded, front broad, the sutures curving slightly to the base of the clypeus, rather full; the clypeus short, lateral margins curved; the loræ divided below, distinct from the margins of the cheek, the border of the cheek nearly straight from the eye to the clypeus; pronotum about twice as wide as long, smooth, lateral borders short; posterior margin very slightly concave; scutellum broad, short, impressed on the middle; elytra of the brachypterous form reaching the penultimate segment, broadly rounded behind, divergent on the dorsum, the apical cells much shortened, discal cells shorter but in the normal position; the wings about half the length of the elytra, very delicate; the cells usually bordered with faint fuscus markings.

Color: Light grass green; the vertex with faint dusky markings near the anterior border, the front with about four dusky arcs each side; the beak brown, anterior and middle femora annulate with brown, and the tarsal spurs black; elytra either hyaline or with faint fuscus markings bordering the cells.

Genitalia: Last ventral segment of the female longer than the preceding ones; the posterior border sinuate, notched near the center, leaving a distinct, broad, rounded tooth or lobe on the median line; pygofer broad, short, equaling the ovipositor in length, very sparsely ciliate behind. Male valve very short, rounded behind, the plates broad at base and with elongate, bluntly acuminate tips, reaching to the tip of the pygofer; the pygofer short, scantily ciliate at the tip.

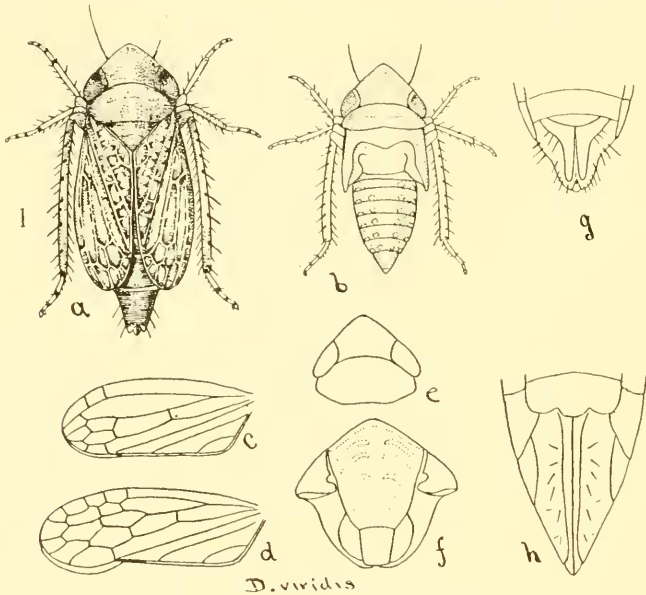


Fig. 7. *Deltocephalus viridis*, n. sp. a, dorsal view of micropterous female; b, nymph; c, elytron of macropterous form; d, elytron of macropterous form; e, head and pronotum of male; f, face; g, genitalia of male; h, genitalia of female. (From drawings by Miss Charlotte M. King.)

The nymphs are similar in form to the adults and differ from them in lacking wings, the wing pads of what appears to be the mature nymph extending but slightly beyond the borders of the thoracic segments. The eyes are dusky.

Type No. 22810. U. S. National Museum.

This interesting member of the genus occurred in considerable numbers and in long and short winged forms, and also as larvæ in the bottom of the resaca at Brownsville, Texas, living in a dense turf of fine grass, where it evidently spends the year, as the specimens were taken during February, 1910.

The species is evidently an abundant one, and there can be no question as to the food plant being the abundant grass on

which the larvæ and adults occurred, as it was not taken from any of the surrounding grasses. It is well adapted to the particular environment, being of practically the same color as the grass on which it lives, and the reduction of wings is an indication that it has acquired a definite restriction to the locality in which it occurs.

The micropterous form has venation similar to *Lonatura* especially *L. megalopa*, but the macropterous venation is distinctly *Deltocephaloid* with both middle and outer antecapical cells divided by cross veinlets.

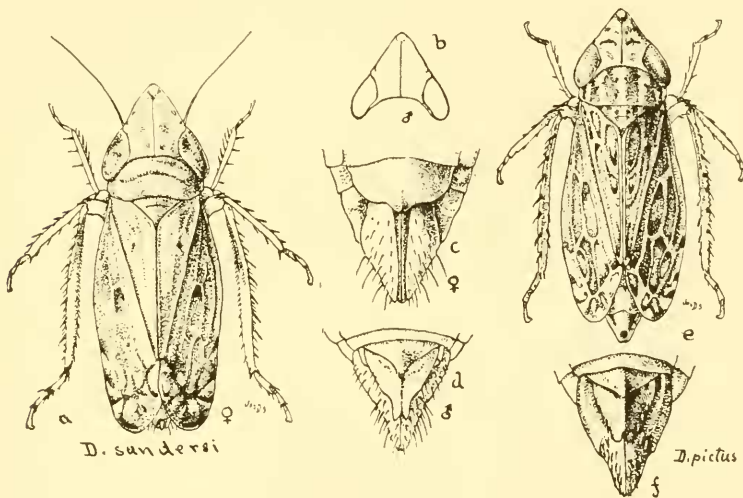


Fig. 8. *a*, dorsal view of female; *b*, vertex of male; *c*, genitalia of female; *d*, genitalia of male *Deltocephalus sandersi*; *e*, dorsal view; *f*, genitalia of male *Deltocephalus pictus*. (From drawings by Mr. J. D. Smith.)

Deltocephalus pictus Osb.

Proc. Davenport Acad. Sci., Vol. X, p. 165.

This species was described from one specimen collected on Staten Id., but has since been taken in Tennessee by DeLong, and I have taken it in considerable abundance in North Carolina. The accompanying figures will assist in the recognition of the species.

Deltocephalus sandersi Osb.

Proc. Davenport Acad. Sci., Vol. X, p. 164.

This species was first taken in the vicinity of Washington, D. C., by Prof. J. G. Sanders, but its distribution has been found to extend over quite a range of the Atlantic States and into Tennessee, where it was collected by Mr. DeLong.

Ohio State University, Columbus, Ohio.